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BUILDING MATHEMATIC CLASS WARMTH TO GROW LONG-LIFE LEARNING SPIRIT

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Abstract

Being a teacher is some honour to participate in building a civilized world civilization. The successful world civilization development cannot be independent of the successful development of human mental through education. For that reason, it is very important to grow awareness and to develop a long-life learning spirit among the students. One idea of realizing it was to build warmth in mathematic class. The rigid, sterile, dry or less meaningful mathematic class that results in trauma in the students should be left and managed into a warm mathematic class.

This article was a result of library study and the authors' best experience in the field raising creative ideas to build a warm mathematic class; thereby the mathematic learning became joyful, meaningful, challenging and providing solution to real problem and growing a long-life spirit learning within the students. Those ideas were related to what should be known about the potential mathematic students, what the teacher should be prepared to design a warm mathematic class, and how to design a warm mathematic class. From the result of library study and the authors' best experience, it could be concluded that: (a) as a facilitator, the teacher should create mathematic class warmth by building close relationship between teacher and students, (2) the teacher should pay attention to the problem of meaningful and challenging learning, the students' intellectual development level, learning style, prerequisite ability, interactivity, feedback, learning strategy, positive and joyful emotional climate, and conducive environment, and (3) the teacher should create an opportunity of developing a sustainable profession.

Key words: *Long-life learning, joyful & meaningful learning*.

INTRODUCTION

Math learning activity is a complex process. Many factors affect learning process: diverse background of students (learning style, intelligence level, sex, etc), infrastructure, curriculum, teacher, media, method, and learning evaluation. Teacher should be aware that the students are present in the classroom with diverse potentials. One of teacher's duties is to facilitate such the individual potentials to develop optimally. Learning will run optimally when there is a positive close inner relationship between teacher and students. Good communication between teacher and students will make the learning process run more smoothly in the classroom. When the close relationship has been established between teacher and students, the classroom warmth will be built easily, so that the productive math class will be brought into reality.

The function and objective of national education as mandated in Article 3 of the Republic of Indonesia's Law Number 20 of 2003 about National Education System is as follows:

> *"National education functions to develop ability and to create the nation character and civilization that are prestigious in the attempt of intellectualizing the nation life, aiming*

at developing the students' potential to be human beings who have faith and piety to the Almighty God, have noble character and knowledge, are healthy, competent, creative, independent, and become democratic and responsible citizens."

Considering the article, there are three functions of national education: (1) the first is 'to develop ability', meaning that the students have great potential so that Indonesian education should be able to facilitate it to develop optimally, (2) the second is "to create character", meaning that the implementation of national education should focus on creating the students' character, and (3) the third is 'nation civilization' meaning that to build and to create a civilized nation, Indonesia needs educated human beings.

The consequence of Article 3 of the Republic of Indonesia's Law Number 20 of 2003 about National Education System is that teacher is required to be able to facilitate the students optimizing their potentials and developing their internal positive character in order to create noble characters. It means that teacher as an educator plays an important part in the achievement of education objective. Teacher contributes to creating the student character, and optimizing the student potential, rather than merely serving as material deliverer in the classroom.

Brant (1988) in his study found that learning will bring about the best output when: (1) what the students learn personally is meaningful, (2) what the students learn is challenging in nature, (3) what they learn is consistent with their intellectual development level, (4) the students can learn in their own way (learning style) have choice, and feel to be facilitated, (5) the students use what they know to build new knowledge, (6) the students have opportunity of interacting socially, (7) the students get helpful feedback, (8) the students obtained and used strategy, (9) the students experience a positive and joyful emotional climate, and (10) conducive environment supporting the learning. Thus, the teacher is required to design learning in order to be acceptable to the students, the meaningful and joyful learning corresponding to the students' own thinking level and potential.

The different characteristics of students affect learning style, readiness, and interest of individual students. Generally, teacher design teaching-learning activity process regardless the difference existing within the students, so that individual students get the same treatment in developing the potential they have. The learning ignoring different potentials or conditions of students including learning style, readiness, and interest will result in learning problem/difficulty among the students. This kind of learning will result in less maximum output.

Creative ideas to design a warm classroom with joyful and meaningful learning will raise and be realized when: (1) *Teacher has independent, innovative, persistent personality and thinking, (2) teacher has multiple talents and adequate academic ability, (3) there is a close and positive inner relationship between teacher and students*. The attempts of improving the teacher's academic ability include: (1) to be open to learning critique and recommendation from students and peer, (2) to observe the math learning classroom of peer, (3) to attend seminar, workshop, scientific discussion, symposium activities in regency, national, and international levels, (4) to initiate MGMP (Subject Teacher Discussion) activity, scientific gathering, dissemination, etc, (5) to establish good relationship with math education institution or practitioners, (6) to attend teacher competition, seminar and research finding presentation, (7) to conduct some research to improve the quality of learning.

Some attempts taken to build the close inner relationship between teacher and students are: (1) to list the personal information on the prospect students (personal, parent, life, address, education history, readiness level, learning style data, etc), (2) to commit to jointly success in the classroom in the beginning of school year, (3) to use learning media, (4) to design the challenging 10-minute in the closing session of learning, (5) to design the joint learning activity out of learning hour.

Information on family, social economic and education history background of students will be very helpful to analyzing the problem rising after the teaching-learning activity proceeds. Student personal data can be obtained easily from the student database at school. Information on social economic and family background can be obtained from class guardian and student counseling teacher.

Student readiness level is desirable to find out whether the student ability belongs to low, medium, or high category to adjust the treatment to his/her ability. This readiness can be obtained from the data of daily quiz scores, rapport values or pre-assessment values last year. The teacher should prepare the students with exercises according to their readiness level. Presumably, the students generally still get the same learning source, process and evaluation in the classroom, while individual students have different ability. The students with low readiness level will receive the teacher's explanation differently compared with the students with medium or high readiness level. Similarly, the students with visual, visual reading and kinesthetic learning styles will be different in level and material absorption method from those with auditory learning style. Franklyn Chernin (2011) stated that an individual will learn more successfully by optimizing their personal learning style. The math teacher generally faces some difficulties in dealing with the students with kinesthetic learning style. Considering the result of observation on Elementary, Junior High, and Senior High/Vocational Middle schools, it could be found that the students with kinesthetic learning style tend to make noise in the classroom, because they cannot be silent in a relatively long time, and need physical (practical) activity to understand something. When this condition is left running prolonged, the learning output of students with kinesthetic learning style will not be as optimal as that of those with auditory learning style who can absorb the learning well in the application of lecturing method. Similarly, the students with Visual and Visual Reading learning style will not reach the same output without compatible supporting media.

The constructivism becoming trend in this age believes that learning is the results of students' self construction and of their interaction with learning environment. The teacher serves as facilitator, mediator, and counselor who design the effective learning to the students. The effective learning process can be achieved by selecting appropriate approach, method and learning media in order to create conducive, joyful and meaningful learning circumstance to the students. Based on this perspective, the learning media use is very helpful to assimilation and accommodation process in constructing knowledge within the students. The intended learning media are: textbook, module, transparency overhead, film, video, television, slide, hypertext, web, visual aid, and traditional or modern game. Daryanto (2010: 5) suggested that generally learning media has some uses: (1) clarifying the message to make it less verbalistic, (2) coping with limited space, time, effort, and sensory power, (3) generating learning passion, more direct interaction between students and learning source, (4) enabling the students to learn independently corresponding to their talent and visual, auditory, and kinesthetic abilities.

The first meeting between teacher and students in the beginning of school year is the time determining the success of learning process in the year and subsequently. The proximity of teacher to students begins with introduction process and class agreement built in the beginning of school year. Dr. Wong explained that teachers build their classroom effectively in the first weeks of school year (2009: 4). The classroom agreement is organized together, containing the rules applied during the teaching-learning process. In addition, the enforcement of class agreement should be upheld. Even a small violation that is not dealt with corresponding to the class agreement will make the built rule collapse. Consequently, the class conditioning will be harmed. The writers emphasize on getting the students disclose transparently the difficulty problem sin learning, honest, timely, self-confident, and appreciating each other. For example, when the students have a discussion and the teacher wants to convey something, it is agreed that the teacher will blow a whistle once. The agreed response is that all of students will stop their activity and focus on what the teacher conveys.

Education media can be used to build conception and mastery of education object. Several education media frequently used in learning are printed media, electronic media, model, and map. Another medium used in math learning is concept map. Concept map media aims to build the students' knowledge in learning systematically, as the technique of improving the student knowledge in mastering the learning concept and in solving the problems (Pandley, et al., 1994). Concept map is an education media that can show a systematic discipline concept,

beginning from the core of problem to the supporting parts having relation to each other, so that the knowledge can be created and the conception of a learning topic can be facilitated. The measure that should be taken in learning model innovation with concept map media is to think of what becomes the 'focus' of topic to be taught, something considered as the 'core' concept in which other supporting concepts can be organized into the core one, and then writing meaningful words, terminology, and formulas, and finally creating a map of integral and interrelated relationship between top-bottom-lateral concept.

Learning will have high meaningfulness by explaining the relationship between concepts (Dahar, 1989: 132). It means that concept can be conceived through its interaction with other concept. The concept map the writers develop is not an ordinary concept map, but it has been modified with daily problem stories or even math history, as illustrated in the sample concept map below.

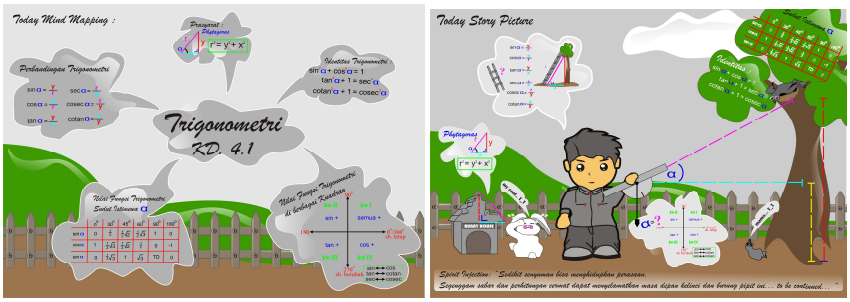

Figure 1. Storytelling Concept Map

Other learning media constitutes the instruments used in field practice or in working on the math project problem, such as clinometers, parabolic painting board, etc.

Designing the 10-minute activity closing the teaching session becomes a very important thing to generate the students' curiosity of meeting the next learning. When the teacher can stimulate the students to be addicted to doing the small challenges related to math, the proximity of students to the teacher will be established by itself. Several challenges the writers give to the students are: educational game tool, Sudoku game, puzzle, word guessing, etc.

Figure 2. Educational game

4	9	3	7	8	5	1	2	6
2								
1								
	5	8						
6	1	4						
7		9						
9								
5								

Figure 3. Sudoku Game

The challenging game is given to the students who face the challenge bravely or as the appreciation to the active students that day. This challenge is presented to deal with the students who will generally be noisy and to end the lesson. Considering the writers' experience, this method is sufficiently effective to deal with it and even makes the students challenged to solve the problem/game. In addition, the writers end the lesson with advice or spirit injection to motivate the students. When the predicted time is not adequate, the writers prepare short story writings combined with prose containing advice and motivation.

In addition to designing the challenging learning closing activity, the utilization of nature is sometimes put into agenda of math learning. The geographic condition of Yogyakarta with many beaches constitutes a distinctive advantage to conduct outdoor learning activity. The student residences are distributed throughout regency until the coastal area. The charm of beautiful nature makes the students conceive easily the natural phenomena related to math the

teacher delivers. For example, observation on Bribin Cave will be an extraordinary knowledge to the students of Architecture and Civil Engineering department of Vocational Middle School. Bribin Cave is the world karst tourist object becoming the focus of researches on vertical cave by Germany. Designing learning activity while playing and exploring nature will help establish close relationship between teacher and students. Visiting the dream universities can also become distinctive attraction to the students. In addition to natural exploration, learning can be integrated into other lesson such as entrepreneurship. Social arithmetic material can be used as the means of discussing the result of students' trading practice related to profit, discount, income, and capital.

In addition integrating the contextual problem into other material, learning can be done with game. Game is any contest between the players interacting with each other by following certain rules to achieve certain objectives. Game for Vocational Middle School (SMK) student level is not to change the abstract into the concrete thing but to accommodate the need of the students with kinesthetic learning style and to make innovation in order to get joyful learning activity. The writers develop math game tools by adopting the children games existing in market, like monopoly, domino and travel game. Travel game is one of learning media constituting the game with two numbered dices as its main equipment and its operation, playing board, item card, item card answer key, and item answer key for two-dice operation. Travel game is adopted by Prof. Alan White, a lecturer of University Western Sydney, from article entitled "*Games in Senior High Math Classes*" in *The Mathematics Teacher* journal written by Gilman, Rowe, and Hildenberger in 1976. Prof. Allan White tried to adapt Travel Game to various classrooms. In practice, this game can be designed easily, cheaply, efficiently and applicable to various levels (Elementary, Junior High, and Senior High/Vocational Middle Schools). Travel game is designed to recall and to drill the skill of previous learning material.

Implementing all of those ideas is not easy. There will be many reactions from related environment. For that reason, strong spirit, positive belief, and accommodative knowledge are needed to be synergic sustainably. The only objective is to build warmth in math class in order to grow awareness and to develop long life learning spirit.

DISCUSSION

The use of learning media, particularly game, not always runs smoothly. Not all math teachers realize the importance of facilitating the students with media as optimally as possible. Consciously, it is not easy to manage the student-oriented learning. Individual children are expected to be facilitated and guided to learn according to their learning speed, character and learning style, and talent and interest. At the same time, the teacher should prepare learning material and different method corresponding to the students' potential and character. Some teachers who have not believed yet in this game's usefulness protest this, and focus more on its negative effect. Some disagreeing teachers say that game is no longer appropriate to be give to Senior High/Vocational Middle School (SMA/SMK) students because they has been in abstract operating level; in addition the game practice in teaching-learning activity will result in noise thereby harming other classes. The protest can be tolerated, because they have not known yet the objective and the benefit of game to Senior High/Vocational Middle School students. Game/practice, for Senior High/Vocational Middle School students, serves not to convert the abstract into the concrete things, but to facilitate the students with Kinesthetic learning style. Nevertheless, such the protest elicits positive reaction to learning development using game. Prof. Allan White gives solution to practicing learning with outdoor game, in order to avoid noise in the classroom. He also offers (invites) the math teachers to join the students playing the Travel Game, so that they are aware of pleasure and challenge the students face so that they enjoy the learning process.

Integrating the math into other subject or activity in the nature is not easy. However, with good will and positive belief, all of ideas can be communicated to a variety of related parties to ensure that they run smoothly. Timing and mature preparation determines this activity success.

CONCLUSION AND SUGGESTION

From a variety of elaboration above, the following conclusions can be drawn. (1) As a facilitator, teacher should create the warmth in math class by establishing the close relationship between teacher and students. (2) The teacher should take the research result into account

(Brandt, 1988); learning will provide the best output when: (a) the learning is meaningful, (b) the learning is challenging, (c) the learning is consistent with the students' intellectual development level, (d) the students can learn with their own way, have choice, and feel being facilitated, (e) the students use the unknown to build new knowledge, (f) the students have opportunity of interacting socially, (g) the students get feedback, (h) the students obtain and use strategy, (i) the students experience positive and joyful emotional climate, and (j) conducive environment. Therefore, the teacher is expected to design the meaningful and joyful learning creatively and innovatively. (3) The attempts of improving the teacher's academic ability include: (a) open to learning critique and recommendation from students and peer, (b) observation in math learning class of the peers, (c) attending MGMP (Subject Teacher Discussion) activity, scientific gathering, dissemination, etc, (e) establishing good relationship with math education institution, (f) attending teacher competition, seminar & presentation on research result, (g) conducting some researches to improve the quality of learning. (4) The attempts of establishing the close inner relationship between teacher and students are: (a) to list the personal data of prospect students, (b) to make introduction and class agreement, (c) to use learning media, (d) to make the last 10 minutes in learning session impressive and challenging with the game, (e) to design jointly learning activity beyond learning hour: Tadzabur (being familiar) with nature by going to the beach, exploring Bribin Cave (the World Karst Tourist Object), Home Visit, (entrepreneurship) practice, visiting the dream universities, designing educational game "*Travel Game*".

Teachers as the starting point of education should have a long-life learning spirit. Thus, they will be spurred to be the educational problem solver, and enthusiastically develop and update their academic and pedagogic knowledge. As such, the development of civilized world civilization will be well-maintained and better.

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